Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A temperature management system for the temperature management of a thermal component comprising:

a heat exchanger thermally coupled with the thermal component;

a heat storage unit comprising a phase change material enclosed in a jacket;

a thermal conduit system thermally coupling the heat exchanger with the heat storage unit; and

where the heat exchanger, heat storage unit, and thermal conduit system are in a downhole tool; wherein said heat storage unit ~~is capable of managing the temperature of the thermal component by storing~~ absorbs and stores heat from the thermal component while maintaining all phases of the phase change material within the jacket; and the jacket does not allow the phase change material to be transferred out of the jacket.

2. (original) The temperature management system of claim 1 where the heat exchanger is a micro-capillary, cold plate heat exchanger.

3. (original) The temperature management system of claim 1 where the thermal conduit system comprises a thermally conductive material.

4. (original) The temperature management system of claim 1 where the thermal conduit system comprises a coolant fluid conduit system for the flow of a coolant fluid.

5. (original) The temperature management system of claim 4 further comprising a fluid transfer device for flowing the coolant fluid through the thermal conduit system.

6. (original) The temperature management system of claim 1 where the temperature management system and the thermal component are in a tool selected from the group consisting of a downhole drill string tool, a downhole wireline tool, a permanently installed downhole tool, or a temporary well testing tool.

7. (original) The temperature management system of claim 1 where the thermal component is selected from the group consisting of a heat generating component, a heat dissipating component, or a heat sensitive component.

8. (original) The temperature management system of claim 1 where the thermal component is in an environment with a higher temperature than the thermal component.

9. (withdrawn) The temperature management system of claim 1 where the thermal component is in an environment with a lower temperature than the thermal component.

10. (canceled)

11. (currently amended) The temperature management system of claim ~~10~~ 1 where the phase change material comprises a eutectic material.

12. (original) The temperature management system of claim 1 where the temperature management system is at least partially contained within a thermal barrier.

13. (original) The temperature management system of claim 12 where the thermal barrier comprises an evacuated container.

14. (original) The temperature management system of claim 13 where the evacuated container is filled with a thermally hindering material.

15. (original) The temperature management system of claim 5 where the fluid transfer device comprises a pump.

16. (canceled)

17. (original) The temperature management system of claim 1 comprising more than one heat exchanger and wherein the thermal conduit system comprises more than one thermal conduit branch allowing fluid flow through the heat exchangers.

18. (original) The temperature management system of claim 17 further comprising a valve for controlling fluid flow through the heat exchangers.

19. (original) The temperature management system of claim 17 where the heat exchangers are arranged in the thermal conduit system in parallel.

20. (original) The temperature management system of claim 19 comprising a valve for controlling fluid flow through the heat exchangers.

21. (original) The temperature management system of claim 17 where the heat exchangers are arranged in the thermal conduit system in series.

22. (original) The temperature management system of claim 21 comprising a valve for controlling fluid flow through the heat exchangers.

23. (original) The temperature management system of claim 17 where the heat exchangers are arranged in a combination of series and parallel.

24. (original) The temperature management system of claim 23 comprising a valve for controlling fluid flow through the heat exchangers.

25. (original) The temperature management system of claim 4 where the thermal conduit system is closed loop system.

26. (withdrawn) The temperature management system of claim 4 where the thermal conduit system is an open loop system.

27. (previously presented) The temperature management system of claim 1 where the heat exchanger is thermally coupled by a conductive path to the thermal component.

28. (previously presented) The temperature management system of claim 1 where the heat exchanger is thermally coupled with the thermal component by at least one of convection and radiation.

29. (withdrawn) A temperature management system for temperature management a thermal component comprising:

a heat exchanger thermally coupled with the thermal component;

a heat sink; and

a thermal conduit system thermally coupling the heat exchanger with the heat sink, the thermal conduit system comprising a thermally conductive material.

30. (withdrawn) The temperature management system of claim 29 where the temperature management system and the thermal component are in a tool selected from the group consisting of a downhole drill string tool, a downhole wireline tool, a permanently installed downhole tool, or a temporary well testing tool.

31. (withdrawn) The temperature management system of claim 29 where the thermal component is selected from the group consisting of a heat generating component, a heat dissipating component, or a heat sensitive component.

32. (withdrawn) The temperature management system of claim 29 where the thermal component is in an environment with a higher temperature than the thermal component.

33. (withdrawn) The temperature management system of claim 29 where the thermal component is in an environment with a lower temperature than the thermal component.

34. (withdrawn) The temperature management system of claim 29 where the heat sink comprises a phase change material.

35. (withdrawn) The temperature management system of claim 34 where the phase change material comprises a eutectic material.

36. (withdrawn) The temperature management system of claim 29 where the temperature management system is at least partially contained within a thermal barrier.

37. (withdrawn) The temperature management system of claim 36 where the thermal barrier

comprises an evacuated container.

38. (withdrawn) The temperature management system of claim 37 where the evacuated container is filled with a thermally hindering material.

39. (withdrawn) The temperature management system of claim 29 further comprising more than one heat exchanger and wherein the thermal conduit system comprises more than one thermal conduit branch.

40. (withdrawn) The temperature management system of claim 39 wherein the heat exchangers are arranged in the thermal conduit system in parallel.

41. (withdrawn) The temperature management system of claim 39 wherein the heat exchangers are arranged in the thermal conduit system in series.

42. (withdrawn) The temperature management system of claim 39 wherein the heat exchangers are arranged in a combination of series and parallel.

43. (withdrawn) The temperature management system of claim 29 wherein the heat exchanger is thermally coupled by a conductive path with the thermal component.

44. (withdrawn) The temperature management system of claim 29 where the heat exchanger is thermally coupled with the thermal component by at least one of convection and radiation.

45. (previously presented) A temperature management system for temperature management a thermal component comprising:

a micro-capillary, cold plate heat exchanger thermally coupled with the thermal component;

a heat storage unit;

a thermal conduit system thermally coupling the heat exchanger with the heat storage unit, the thermal conduit system comprising a coolant fluid conduit system for the flow of a coolant fluid;-

a fluid transfer device for flowing the coolant fluid through the thermal conduit

system; and

where the heat exchanger, heat storage unit, thermal conduit system, and fluid transfer device are in a downhole tool.

46. (original) The temperature management system of claim 45 where the temperature management system and the thermal component are in a tool selected from the group consisting of a downhole drill string tool, a downhole wireline tool, a permanently installed downhole tool, or a temporary well testing tool.

47. (original) The temperature management system of claim 45 where the thermal component is selected from the group consisting of a heat generating component, a heat dissipating component, or a heat sensitive component.

48. (original) The temperature management system of claim 45 where the thermal component is in an environment with a higher temperature than the thermal component.

49. (withdrawn) The temperature management system of claim 45 where the thermal component is in an environment with a lower temperature than the thermal component.

50. (previously presented) The temperature management system of claim 45 where the heat storage unit comprises a phase change material.

51. (original) The temperature management system of claim 50 where the phase change material comprises a eutectic material.

52. (original) The temperature management system of claim 45 where the temperature management system is at least partially contained within a thermal barrier.

53. (original) The temperature management system of claim 52 where the thermal barrier comprises an evacuated container.

54. (original) The temperature management system of claim 53 where the evacuated container is filled with a thermally hindering material.

55. (original) The temperature management system of claim 45 where the fluid transfer device comprises a pump.

56. (canceled)

57. (original) The temperature management system of claim 45 comprising more than one heat exchanger and wherein the thermal conduit system comprises more than one thermal conduit branch allowing fluid flow through the heat exchangers.

58. (original) The temperature management system of claim 57 further comprising a valve for controlling fluid flow through the heat exchangers.

59. (original) The temperature management system of claim 57 where the heat exchangers are arranged in the thermal conduit system in parallel.

60. (original) The temperature management system of claim 59 comprising a valve for controlling fluid flow through the heat exchangers.

61. (original) The temperature management system of claim 57 where the heat exchangers are arranged in the thermal conduit system in series.

62. (original) The temperature management system of claim 61 comprising a valve for controlling fluid flow through the heat exchangers.

63. (original) The temperature management system of claim 57 where the heat exchangers are arranged in a combination of series and parallel.

64. (original) The temperature management system of claim 63 comprising a valve for controlling fluid flow through the heat exchangers.

65. (original) The temperature management system of claim 45 where the thermal conduit system is a closed loop system.

66. (withdrawn) The temperature management system of claim 45 where the thermal conduit system is an open loop system.

67. (previously presented) The temperature management system of claim 45 where the heat exchanger is thermally coupled by a conductive path with the thermal component.

68. (previously presented) The temperature management system of claim 45 where the heat exchanger is thermally coupled with the thermal component by at least one of convection and radiation.

69. (currently amended) A method of absorbing heat from a thermal component comprising:

absorbing heat from the thermal component with a heat exchanger thermally coupled with the thermal component in a downhole tool;

transferring heat absorbed from the heat exchanger through a thermal conduit system in the downhole tool; ~~and~~

storing heat transferred through the thermal conduit in a heat storage unit in the downhole tool, the heat storage unit comprising a phase change material enclosed in a jacket; and

maintaining all phases of the phase change material in the jacket.

70. (previously presented) The method of claim 69 further comprising:

flowing coolant fluid through the thermal conduit system thermally connecting the heat exchanger to the heat storage unit using a fluid transfer device;

absorbing heat from the heat exchanger with the coolant fluid as the coolant fluid flows through the heat exchanger; and

absorbing heat from the coolant fluid with the heat storage unit as the coolant fluid flows through the heat storage unit.

71. (canceled)

72. (currently amended) The method of claim ~~71~~ 70 where the phase change material is a

eutectic material.

73. (original) The method of claim 69 where the heat exchanger is a micro-capillary, cold plate heat exchanger.

74. (original) The method of claim 69 where the thermal component is in a tool selected from the group consisting of a downhole drill string tool, a downhole wireline tool, a permanently installed downhole tool, or a temporary well testing tool.

75. (original) The method of claim 69 where the thermal component is selected from the group consisting of a heat generating component, a heat dissipating component, or a heat sensitive component.

76. (original) The method of claim 69 where the thermal component is in an environment with a higher temperature than the thermal component.

77. (withdrawn) The method of claim 69 where the thermal component is in an environment with a lower temperature than the thermal component.

78. (currently amended) A method of absorbing heat from a thermal component comprising:

absorbing heat from the thermal component with a heat exchanger thermally coupled with the thermal component in a downhole tool;

flowing coolant fluid through a closed loop thermal conduit system thermally coupling the heat exchanger with a heat storage unit using a fluid transfer device, the thermal conduit system being in the downhole tool and the heat storage unit comprising a phase change material enclosed in a jacket;

absorbing heat from the heat exchanger with the coolant fluid as the coolant fluid flows through the heat exchanger; ~~and~~

absorbing heat from the coolant fluid with the heat storage unit as the coolant fluid flows through the heat storage unit; and

maintaining all phases of the phase change material in the jacket.

79. (canceled)

80. (original) The method of claim 78 where the phase change material is a eutectic material.

81. (original) The method of claim 78 where the heat exchanger is a micro-capillary, cold plate heat exchanger.

82. (original) The method of claim 78 where the thermal component is in a tool selected from the group consisting of a downhole drill string tool, a downhole wireline tool, a permanently installed downhole tool, or a temporary well testing tool.

83. (original) The method of claim 78 where the thermal component is selected from the group consisting of a heat generating component, a heat dissipating component, or a heat sensitive component.

84. (original) The method of claim 78 where the thermal component is in an environment with a higher temperature than the thermal component.

85. (withdrawn) The method of claim 78 where the thermal component is in an environment with a lower temperature than the thermal component.

86. (withdrawn) The temperature management system of claim 1 where the thermal conduit system thermally couples the heat exchanger with the heat sink via at least one of conduction, convection, and radiation.

87. (withdrawn) The temperature management system of claim 1 further comprising a second heat exchanger to transfer heat from the thermal conduit system to the heat sink.

88. (withdrawn) The temperature management system of claim 29 further comprising a second heat exchanger to transfer heat from the thermal conduit system to the heat sink.

89. (withdrawn) The method of claim 69 further comprising absorbing heat from the heat exchanger with the heat sink via at least one of conduction, convection, and radiation.